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CACTUS AND SUCCULENT JOURNAL

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Neomammillaria goodridgii (Scheer) Br. & Rose x1.0

Journal of the

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PRESIDENT'S COLUMN

A few of our members are still under the impression that every plant that grows in a Succulent collector's garden is a cactus. For their benefit I will list the following, but first let me state that all cacti are succulents but all succulents are not cacti. The following generic names are cactus: *Pereskia, Pereskiopsis, Epiphyllum, Opuntia, Cereus, Cephalocereus, Trichocereus, Pachycereus, Lemaireocereus, Bergerocactus, Nyctocereus, Ferocactus, Echinocactus, Astrophytum, Coryphantha, Neomammillaria, Rhipsalis, Zygocactus, Schlumbergeria* and many others. The following generic names are succulents other than cactus and should not be called cactus: *Euphorbia, Mesembryanthemum, Echeveria, Dudleya, Stylophyllum, Aloe, Haworthia, Gasteria, Aprica, Sedum, Sempervivum, Crassula, Agave, Yucca, Stapelia* and again many others.

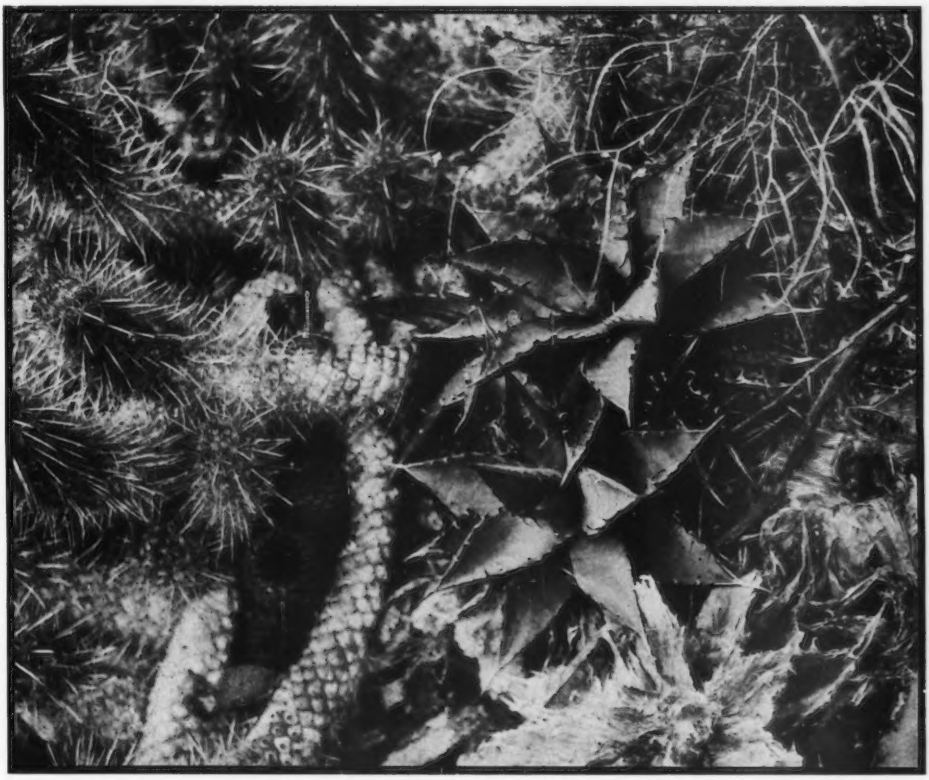
The reason most collectors include many other succulents with their cactus is because of their similarity as to culture, all being of a succulent nature and able to resist excessive respiration and naturally fall into a general classification of garden material. All succulents have the ability to store up excessive amounts of moisture to be used when the dry season is on. Their shape is in most instances conducive to expansion in one way or another as for instance the flat branches of the *Opuntia* become much thicker during the rainy season. *Ferocactus, Cereus,* etc., are deeply ribbed and will stand a lot of expansion much like an accordion. You will be able to note in the early spring that the space between the ribs is wider and not so deep as in the fall. By close observation you can find the secret of storage in nearly all succulents. Some have their leaves so shaped that they catch the dew and spill it close to the stalk on the ground, thereby getting moisture to the roots.

Recently I had the pleasure of visiting the Knickerbocker Nursery in San Diego and was very much surprised at the fine quality of plants offered for sale and at very attractive prices. Mrs. Bakkers certainly knows how to propagate succulents, but of course a little credit must be given to the wonderful soil and climate of San Diego. Her collection is not as complete as Mrs. Helen McCabe's of San Diego or Mr. W. M. Cornelius of Encinitas or Mr. W. I. Beecroft of Escondido, but she has not been collecting very long.

Mr. W. L. Maechlen of Los Angeles left recently for a tour of the United States, Canada, and Mexico. He will call on members of the Society along the route as well as the principal Botanic Gardens in the United States. We may expect to see some valuable additions to his wonderful collection of *Cactus* and *Euphorbias.*

Mrs. Ysabel Wright of Santa Barbara has recently returned from a several months' trip through Mexico. We may look forward to a description of how Mexican Cactus looks in its native country.

R. E. WILLIS, *President,*
2721 Bellevue Ave., Los Angeles, Calif.



Cochemia halei, Agave margaritae, and Neomammillaria goodridgii on Magdalena Island. (x0.25) The trailing habit of the Cochemia is shown here.

A TRIP TO MAGDALENA BAY

By EDGAR BAXTER

(All Photographs by the Author)

Five hundred kilometers by Ford, stopping at nights in houses of cactus wood walls and palm thatched roofs; a half-day trip by sailboat through big ocean rollers breaking on a sand bar and across this mysterious Bay of Magdalena—at last we are at Margarita Island, last visited by a cactus collector about 1911. It is dark and we cannot go ashore in our little "panga" until morning. Excitement is making us restless; the tortillas and beans do not have their appeal; morning is awfully slow in coming. We have read and re-read every available article on the plants of this place and know by heart the reported and supposed-to-be cactuses native here. How far will we have to hike to find them all? How steep and high are those mountain peaks that show black and high above us? Dawn will answer all these things for us—if it ever breaks.

Morning at last, and we are ashore! The cook for the fish cannery has given us some roast turtle sandwiches and we are off on an adventure as thrilling to a cactus fancier as a trip to the poles would be for an explorer. It takes a walk of only a quarter mile until we stop with a thrill to see about a half dozen cactuses—rare and not-so-rare plants that we have read about, dreamed about, and talked about for the past three months. As always in Baja California, *Machaerocereus gummosus* is there with its ocatillo companion *Fouquiera peninsularis*. With these two,

our first welcomers, we do not feel quite so far away from people and places as these last days of travel have tended to make us feel.

Neomamillaria goodridgii is a small, red-spined, globular plant growing along the edge of an arroyo. It is quite common. The flowers closely related.

Two more *Opuntias* of a different type are also present. *Opuntia cholla* and *Opuntia prolifera* are cylindropuntias that differ about the same way as the two *pycnanthas*—one has yellow spines and purple flowers, the other red

Opuntia pycnantha, Eng. (x0.125) Swollen thick and half-crested, this plant is typical of the two varieties found on Margarita Island. On Magdalena Island it maintains the typical oblong shape.

and fruit of the little "pitayita" are to be found on many of the plants. We collected some of these and then looked toward the rarest cactus we have yet seen on the whole trip—*Opuntia pycnantha* and *Opuntia pycnantha margaritana,* both here together on the flat above the arroyo. What is this! A whole plant of crests? It surely is. If it could only be in my garden at home!

For some reason or other, probably the richness of the soil and the plentiful moisture, the pads of all of the plants of this species are fat, crescent-shaped, and often curled as in our common crested opuntias. *Opuntia pycnantha* has the yellow spines and glochids, sharply differentiated from the variety *margaritana,* which has these members in red. Otherwise there is no difference; they grow alongside of each other up high, down low, and on the alluvial washes in between; both show the fascination; the flower is similar, possibly a darker yellow in the variety; they make a bush about three feet high, without any definite form. These two do not look very much like our *Opuntia basilaris* but they are spines and red flowers. In the matters of a trunk and bushy top growth, proliferous fruit, etc., they are similar. The one identified as *Opuntia prolifera* has one characteristic contrary to that given in Standley[1] from Engelmann's description: the terminal branches are not easily detached. We had to cut and break them to take specimens.

A mile further on, we cross more small arroyos and the hills (for that was all those "high, dark mountains" were) fall away, to leave a wide, brush-and-cactus-covered saddle in the middle of the island from ocean to bay. Here we find several clusters of simple looking hedgehog cactuses. No flowers, no seeds—but yes, there are seeds, only they are *neomamillaria* seeds. Out comes the cactus books. "Islands of southern Baja California; type from Magdalena Island" (that isn't far away). "Caespitose; stems nearly upright, often 30 to 50 cm. . . ." "*Cochemia halei.*" Some way or other we had missed this one on our list of expectations. We had seen another *Cochemia* on the mainland, but it ap-

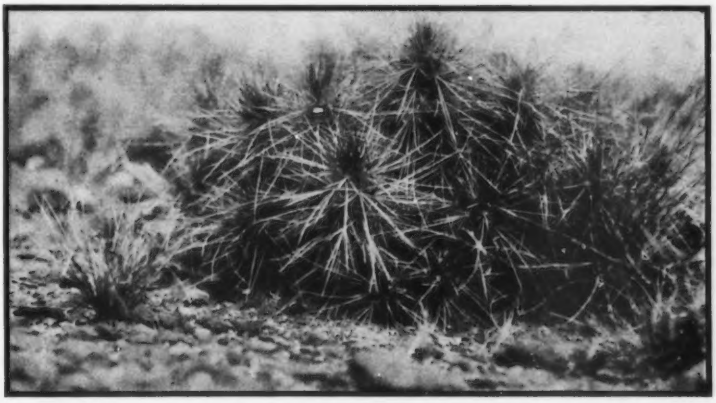
[1]Vol. 23 Part 4, "Trees and Shrubs of Mexico."

peared to be something different. This one resembles an *Echinocereus* greatly, but its seeds cause us to look in another genus for its description. *Cochemia halei* grows in immense clusters "casas de rata" (rat nests).

We next rest our eyes on a solitary giant standing with his arms raised to the skies. He appears to be a quarter mile away mid the ocotillo and

Machaerocereus gummosus (Eng.) Britton & Rose. (x0.025) Photographed at San Jose del Cabo but identical with the form found on the islands, and throughout the peninsula to Ensenada.

two feet wide and two or three to ten feet long. The plant itself is about a foot high and three inches in diameter. Only one flower shows in all the plants we examined. It is long-tubed like a fuchsia, barely opened at the tip, and a brilliant red in color. The season must be late for elephant bushes, the only one in an expanse of miles. A good close look seems necessary and off we stride. Almost there and another solitary specimen shows up. It is a barrel cactus, *Ferocactus peninsulae* we guess, from the clavate form it has taken. Maybe it is *Ferocactus santa-*



Echinocereus bartheloanus Britton & Rose. (x0.25) Found on Magdalena Island. While appearing to be a cluster from a single root, it is not. Each stem in this plant had its own root and was not connected with other stems. The central stems are dead.

them, as seeds are beginning to form from what is apparently this season's dried flowers. It seems odd for a dainty, red, smooth-skinned neomamillaria seed to be growing from these spiny *maria,* because the spines are very evidently in "two series." It's too big to carry, and we go on to view the big, lone *Pachycereus* giant. It's a *Pachycereus* all right, because there aren't any

other genera resembling this one over here, but it doesn't look anything like our pipe-organ—*Pachycereus marginatus*—it has eighteen or more ribs and is about three feet through the trunk at a point five feet above the ground, and the smallest arm is a good eighteen inches in

Pachycereus calvus (Eng.) Goldm. (x0.02) A Solitary specimen on Margarita Island.

diameter and runs up fifteen feet. *Pachycereus calvus* or *titan* it might be, probably the latter. Absence of flowers, etc., make it impossible to identify with certainty.

Nothing more in the cactus line presents itself so we start to look for other things—Burrageas, Euphorbias, etc. We finish the day with these and turn back to our little sailer. It is too late to navigate with safety, the tide is going out, so we make bed on board (the boat is six feet wide, I'm six-feet-two long—what a problem!).

* * *

Twelve hours to the minute, with sharks, porpoises, and seals playing around us all day and with waves almost mast high, we have left La Isla Margarita behind and are on Magdalena Island to find what we can find. It is only Thursday night but for a special treat the skipper's wife has made us their regular Saturday night dish of "menudos," tripe and onion soup. We have to appear pleased—but tripe soup and cinnamon tea!

The next day we scour the place for new plants and find them. *Agave margaritae* is the prettiest one of that whole family of century plants, I believe. It is small, broad-leaved, inward curving at the tips, and with a row of twisted, light brown thorns along both edges. These grow on a hillside, mixed with a white-flowered hen-and-chicken, *Dudleya albiflora,* the same *Neomammillaria* that was on the other island and a small sized variety of *Cochemia halei.* Imagine, if you can, this slope in a deep arroyo with all of these plants, desired by every collector in the world, in greatest profusion—and me with a permit to bring home "one of each of the smallest piece capable of propagation."

There across the arroyo is an odd shaped clump of cactus, and it proves to be an *Echinocereus.* There is a skeleton of last year's seed pod among the densely clustered stems. This must be *Echinocereus barthelowanus* described from this region by Britton & Rose. (Britton & Rose, Cactaceae 3:41. 1922.) It has longer spines than the "casa de rata" and our specimen shows that although it is in an exceedingly dense cluster there are only one or two stems to the root. The seeds fall straight down and grow into plants around the edge of the group. The center of this and other clusters is made up of dead plants. It is strange that there isn't more of this cactus around here; the seeds must be quite fertile. It occurs to me that the birds take all that are not protected by the mother plant within her spiny bosom.

We leave shortly and call it a day. It is a real tug to break away from these rare friends. If fortune smiles, we shall return to renew the acquaintanceship. We pack these specimens for the trip, pick up some of those beautiful odd-shaped shells as souvenirs, say the lengthy farewells that custom demands, load our duffle on board and set sail for those awful rollers breaking over the sand bar at Bay of Medanos Ama-

rillos (Yellow Beach, from the deposit of clam shells).

After about three hours' run comes the highlight of thrills of a month's trip. Let me quote from the log of the trip as it was written at the time!

(Friday, April 11)

"2:50. Goshamighty but did we just have an experience! Trying to come in over the sand bars at the entrance to the landing it was low tide instead of high, as the Captain thought. We grounded, turned broadside to the waves and liked to have turned on over. The waves hit and turned us around until one lifted the bow and sail clear of the water and we caught the wind and rode back out and are now waiting, anchored, for the tide to rise. My heart is still fluttering. We will try again in about an hour. Hope we make it."

"5:10. We did. But only because my fingers were crossed."

CACTUS GARDENS ON WINDOW SILLS

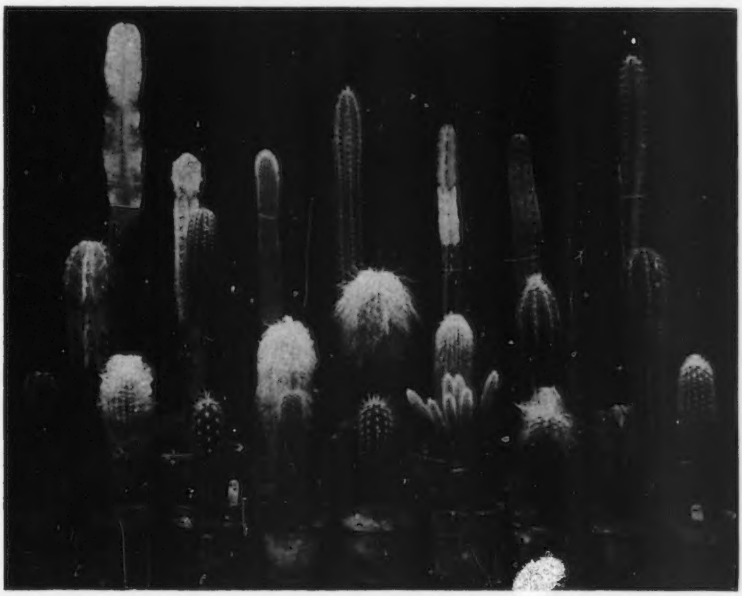
By LEON C. CROIZAT

Having raised cactuses from seed, including *Mammillaria, Neomammillaria, Echinocereus, Cereus, Astrophytum,* on a window sill in prevailing cool and cloudy weather, with temperatures ranging from 45 to 85 degrees Fahrenheit, I have come to the conclusion, much against the common belief (at least here in Brooklyn) that cactus seeds are of easy growth, hardy, and well worth cultivating.

Instructions as to kind of soil, potting, watering, transplanting are offered with the seeds, or are found in special pamphlets, but most of them are so at loggerheads with each other as to confuse if not entirely discourage the amateur. Most of them mention requirements which no dweller of the city has any chance or inclination to comply with. Located on suburban premises, with plenty of space and means, some of the suggestions might be read with serious intent.

It will be my purpose to give a few suggestions derived from my own experience, and from the standpoint of a dweller under the cloudy skies of the East, in a city where space is at a premium, time worth while, and continuous care for the plants next to impossible.

Given right moisture cactus seeds will germinate in almost any kind of soil. They are unbelievably hardy, stand being buried under the most unfavorable conditions. The rule is, however, that the richer the soil the slower the germination. Placed in a rich loam seeds will take four or five weeks to sprout, that would be



A Sill Collection

out of the ground in a week under less richness.

A mixture of sharp sand (about two-thirds) and of good potting soil (little over one-third by volume) will make the right kind of bed for most cactus seed. Potting does not require any special care beyond that given to common flowering plants' seeds of equal bulk. At the bottom of the pot place a few pieces of crock or gravel, even a thin paper layer, to be perforated after the soil has set. Partly fill the pot, pressing the soil down gently all around.

The seeds are arranged next, without crowding, and covered with a thin layer of soil. An extra layer of fine gravel, as recommended by Circular 66 of the U. S. A. Bureau of Agriculture, may be added. It helps to retain the moisture and prevents the seeds from being washed about or disarranged. Water is more important than soil to the cactus seed and seedling. Whenever in doubt regarding water, remember that excess is better than lack of moisture. If the potting is good excess moisture will eliminate itself in short order. However, it is highly advisable not to water seeds from above but from below. Watering the sowing bed or the seedling from above disturbs the soil, and what I believe more important, amounts to a sudden cold shower, which tends to hold back germination and check growth. A tray or saucer with a little water set under the pot will be sufficient to assure an even supply of moisture and the "sill" gardener may go to his vocation with no fear that his beloved seedlings will dry out. Here in the East the quantity of water must be graded by the weather. Another device for watering, particularly adapted to delicate seeds or in case of long absence of the seedsman is to put the seed vessel in a larger pot filled with soil, well watered and packed. See to it that the drain-hole of the seed pot is not chocked or obstructed.

Sunlight is a powerful factor to be reckoned with. Better to leave the little seedlings continuously on some well lighted window ledge, looking to the North or West than to take the chance of ruining a promising bed through a few minutes over-exposure to a torrid sun.

Temperatures may vary, and in our less favored section are a continued menace. Between 65 and 75 degrees is best, but several seed beds and seedlings in my possession have run the gamut between 45 and 110 degrees without damage.

Seeds will germinate in waves; a few generally preceding the bulk by several days. After germination spraying with an atomizer will help, keeping the seedlings from dust and in our city from the ubiquitous grime and soot.

Early transplanting of seedlings is advised in all the sets of instructions on cactus raising from seed I have read. Transplanting with the attending repotting is, however, tedious and dangerous business with the average cactus lover, except when handling plants grown up to good size.

Remember that the seed bed is made up of little more than one-third good soil, and it will not be difficult to increase the percentage of rich material in it as the seedlings take up body, without removing them. Just sift some good dirt with traces of lime (scraping some mortar between bricks will furnish a convenient stuff) on the seedlings at the time they are dry, then wash them with a fine spray. With the addition of this needed food, transplanting may safely be put off until months to come when growth is firmly under way, thus insuring the grower against damages and annoyances met with in handling minute delicate plants but feebly rooted.

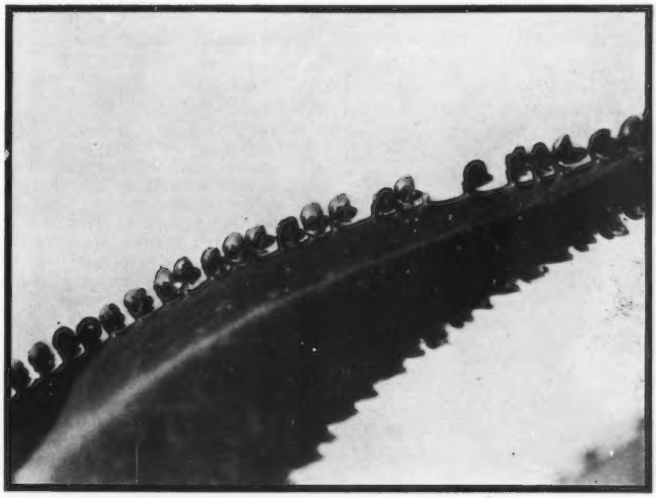
As the seedling grows it requires less water. It is impossible to give hard and fast rules on this point, too much depending on weather, temperature and vegetation. The bigger the plant, the greater its capacity to absorb and store up moisture. The best advice how and when to water will be tendered by the plant itself. A plant in good health displays shiny bright spines, definite colors and green smooth surfaces, and never arrests its growth.

PROFIT IN GROWING CACTI FROM SEEDS

Extract from a letter from Mr. W. E. Hess, General Manager, San Antonio Floral and Nursery Co., San Antonio, Texas, August 18, 1930, to Doctor N. L. Britton.

"Having to keep up with the fashion, some years ago we started to collect and grow cacti and have at present 50,000-60,000 seedlings, mostly foreign, on hand. I find that seedlings make much prettier and better plants than collected ones and that they respond wonderfully to good treatment."

Mail subscriptions to Boyd L. Sloane, 1421 Dominion Ave., Pasadena, Calif. Subscription price $3 per year with or without membership; foreign $3.50.



Bryophyllum daigremontianum (R. Hamet & Perrier Berger)
Part of leaf showing marginal buds (approx. x1)
J. West Photo

BRYOPHYLLUM DAIGREMONTIANUM

By JAMES WEST

In the August issue we promised to show some more of the Madagascan Bryophylla. This month we keep our promise by presenting *Bryophyllum daigremontianum* Berger (*Kalanchoe daigremontiana* R. Hamet & Perrier de la Bathie). This species is very interesting as well as handsome. It is remarkable especially for the way in which the generic tendency towards the formation of adventitious buds (Bryophyllum= growing leaf) is developed.

The leaves, as can be well discerned in the illustration, carry an almost uninterrupted row of buds, or rather plantlets (for they are all complete with leaf, stem and, often, rootlet, ready to pot up) from special minute scales at the tip of each of the numerous small teeth of the leaf-margin. This contributes greatly to the attractiveness of the strange plant, the row of buds making a decorative fringe to the vigorously handsome leaf.

As in many of these Madagascans, one gains an impression of fantastic tropical exuberance foreign to most of the family. It is as though the *Kalanchoideae* had gone on a spree when they spread over Madagascar, much as the humble chamaephytic Semperviva did when they found their promised land in the Atlantic Islands and assumed the dignity of Aeoniums.

The leaves are opposite, as in all Bryophyllums, petiolate, acutely triangular, at the base more or less peltate, up to about 8 inches in length, flat, thick, glossy with prominent nerves, bright green. The underside is grayer, with more or less obscure tiger-like stripes or blotches of purplish gray.

The stem is stout and succulent, very straight and erect. As far as we know the plant has not as yet flowered in this country (Mr. Orpet will please correct us if we are mistaken). Berger describes them as pink, with a tube constricted below the middle, 17 mm. long, the free tips of the corolla ovate, 7 mm. long.

We have not had access to detailed information about the habitat of B. daigremontianum in Madagascar; such is doubtless to be found in the numerous papers on the Madagascar Crassulaceae published by such French botanists as Perrier de la Bathie and R. Hamet.

Little is yet known about its hardiness; just from its looks an old hand will probably regard it with suspicion in this respect: somehow it does not look as if it could be trusted very far. We

shall know better next spring.

The plant is, like most of its kind, an extremely vigorous grower, enjoying high feeding, sun and water; its propagation is in the nature of things of the easiest, indeed practically automatic. The soil surrounding a plant will soon pullulate with a whole population of young plants from the dropped buds. These will fall at a touch, one is tempted to say rather "jump," for their attachment to the mother-plant is of so elastic a nature, that the lightest contact with a probing fingertip will propel them to quite a distance, as may be experienced by anyone trying to induce a bud to fall into the pot below.

Whether hardy or no, the plant is a decided acquisition, making a noble ornament to any greenhouse. We owe its presence among us to the Bureau of Plant Introduction.

Claremont, Calif., Sept. 23, 1930.

On page 318, Vol. 2, No. 3, of the Journal I note the illustration of the "Nest of Cactus Wren in Opuntia fulgida." I believe this to be an error as the nest of the Cactus Wren is always gourd shaped with the entrance through a tunnel shaped opening or runway on the top and side. This is probably an illustration of the nest of one of the Thrashers, which species I do not know, or perhaps of the Western Mockingbird—as these species use cactus in many instances for their nesting sites on our deserts.

WRIGHT M. PIERCE.

FRUITS

By YSABEL WRIGHT, *Santa Barbara, California*

Illustrations by Margaret Kincher

Last, but not least of the means of identification of cactus species, comes the fruit.

In some instances final determination can only be made by the fruit; as, for example, in the case of certain opuntias where it is of great importance to know whether the fruit is dry or moist.

A characteristic of the fruit of one species is usually characteristic of the fruit of the entire genus.

The shape of the fruit, as shown in the accompanying illustration, is an important element in the identification of species.

The manner in which the fruit opens for the discharge of its seeds, or the fact that it does not open at all, but merely dries up, are important indications of the species.

The word "indehiscent" is applied to those fruits that do not split open. Most cactus fruits are indehiscent, drying with the cover on, like a tomato.

The term "dehiscent" is used to describe those fruits that split to permit the escape of the seed contents; such as some of the *Cereae* and most of the harrisias, which split open irregularly.

Bartschella schumannii differs from all similar genera in that its fruits are circumcissile; that is opening by a transverse, circular line, so that the top separates like a lid.

A few cacti, such as *Neoporteria,* a genus native to Chile, dehisce by a basal pore; that is the fruit opens in a more or less regular line starting from the bottom at a basal orifice.

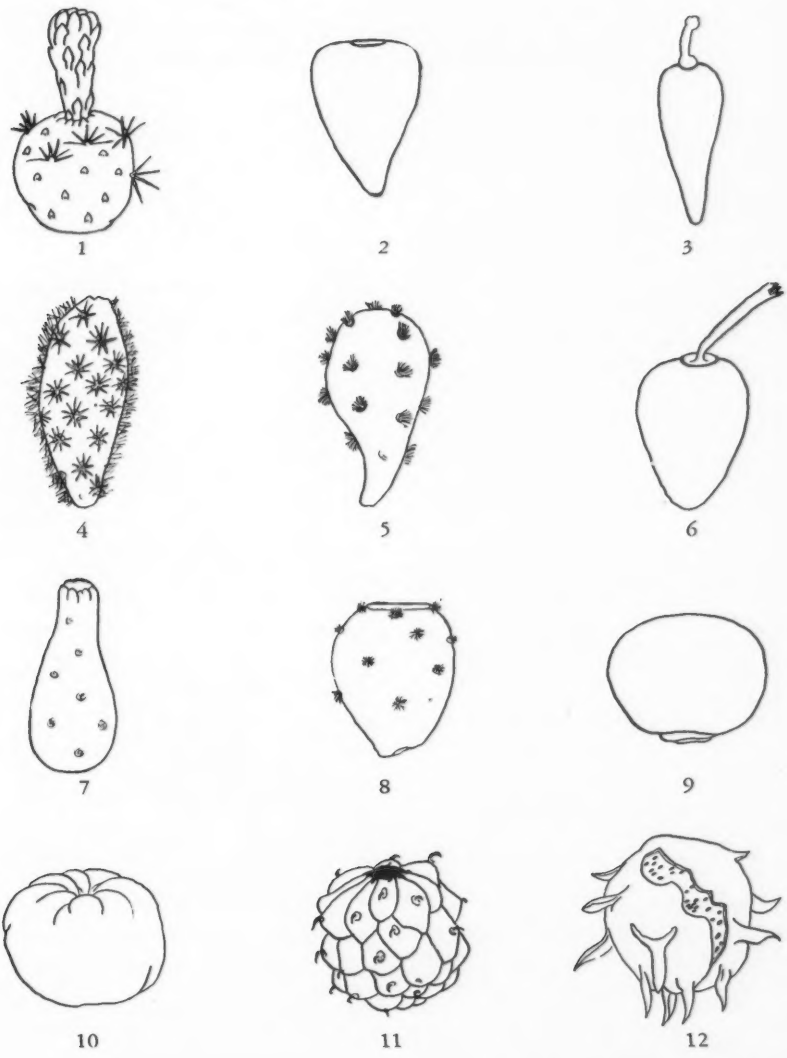
In some Mammillarias, the fruit does not appear till a year after the blossoming. If fruit seems to appear immediately after the flowering it proves, on examination, to be fruit from last year's flowers.

The fruit of many *Opuntias,* especially *O. vulgaris,* will quickly sprout and start new plants. One of the fruits that was picked to serve as a model for an illustration of this article sprouted in the dark box in which it lay.

It is not, however, merely as a means of identifying species that cactus fruit deserves consideration. Even the most indifferent among the uninitiated must be impressed with the spectacular beauty of the fruits, as well as flowers, as he rides by train for hours through the vast cactus covered areas of Mexico. The brilliant fruits, in addition to the flowers that often appear simultaneously on the same plant, form a striking element of color in the weird landscape.

The fruits of various cacti are an important staple of food in Mexico and other cactus producing countries. They are used as food both raw and cooked.

The great, handsome, pink fruits of the tall, columnar Cereae to all of which the Mexican gives the general name of "pitaya," are a spectacular sight in the markets and on the street stands. At almost every corner one sees a big cake of ice on which the ripe fruits of opuntias are cooling after having had the outer skin removed with a knife, and many Mexicans go munching them as they walk. Young opuntia joints are cooked as a vegetable, and sweetmeats and preserves are made of the fruits.



Copyright by Ysabel Wright, Oct., 1930

GLOSSARY

Fig. 1 Globose—the shape of a ball.
Fig. 2 Obconic—inversely conical.
Fig. 3 Clavate—Club-shaped.
Fig. 4 Ellipsoid—oval.
Fig. 5 Pyriform—pear-shaped.
Fig. 6 Obovoid—inversely ovoid.
Fig. 7 Urceolate—urn-shaped.
Fig. 8 Truncate—ending abruptly.
Fig. 9 Compressed-globose—flattened laterally
Fig. 10 Umbilicus—navel-shaped depression in fruit.
Fig. 11 Tuberculate — covered with wart-like excrescences.
Fig. 12 Fruit bursting irregularly.

NOTE: *Sub*—prefixed to any term means *somewhat*.
Example: subglobose—somewhat rounded.

FERTILIZATION IN THE CACTACEAE

By DONALD A. JOHANSEN

Recently a gentleman interestetd in the hybridizing of Opuntias addressed to me an inquiry regarding the time required for fertilization to be effected in these plants. That is to say, how long does it take the pollen grain to germinate and the pollen tube to reach the megagametophyte, whose egg cell, after being fertilized, develops into the embryo? From my own experience, I could only say that in some fruits of *Opuntia engelmannii* which had been removed from the plant about ten days after the flowers had dropped, no trace of the pollen tube could be found. This led me to search the literature, and in the belief that the information secured might be of some use to others occupied in hybridization experiments, it is herewith given in condensed form.

In species of *Epiphyllum* the time varies from 12 to 15 hours; this represents one of the shortest periods required by any species among the higher plants. The only other species studied are various cerei. In *Cereus peruvianus* the time is one week; in *Hylocereus triangularis* and *Harrisia tortuosa* three weeks are required, while in *Selenicereus nycticalus* the pollen tube takes an entire month to traverse the length of the pistil. Data concerning the percentage of successful fertilizations, with particular reference to the growth period of the pollen tube, are nonexistent, but it might be said, as a general thing, that the shorter the period the flower remains fresh and the longer the time required for the pollen tube to reach the egg cell, the lower the percentage of viable seeds.

The First Report on the Number of Chromosomes in the Cactaceae

It has just come to my attention that the first cytological study upon any species of the Cactaceae to be published is the note of T. Ishii in The Botanical Magazine, Tokyo, vol. 43, p. 560, 1929, entitled "Pollen development in Mammillaria sp." Unfortunately, the article is in Japanese, unaccompanied by the customary English resume, and I have not yet been able to have it translated. Ishii does not appear to have his plant properly identified, although he has a photograph of it.

The number of haploid chromosomes apparently varies, as Ishii's figures include in the heterotypic mitosis an equatorial plate of 11, an early anaphase of 6, an early telophase of 8, and a homotypic equatorial plate with 11 chromosomes in each group. Ishii evidently worked upon a polymorphic species similar to *Neomammillaria armillata,* upon which the writer is now working.

COLOR SCHEMES OF CACTI

I wish to call attention to a study of cacti from an entirely different angle, than that of the usual approach, as embodied in a most attractive little booklet issued by the University of Arizona (Tucson) under the title "Color Schemes of Cacti," by John M. Breazeale (June 1, 1930).

This is a thoughtful and intensely interesting study of the color of the cacti in their desert environment, of harmony between the colorization of the flower and its background.

Starting with the assumption "that color in flowers represents an appeal to the pollinating insect"; and that "in the development of a plant, there is but one apparent objective, that is the perpetuation of its species," he follows with a study of the harmony, the contrast, and the use of complementary colors that so perfectly attain their object in the development of color schemes in the cacti: and of the conditions contributing to the accomplishment of this result, in the environment which is their natural habitat.

The text has added interest because of the very beautiful studies in color which illustrate the points made by the author.

—Ethel Bailey Higgins.

EDITOR'S NOTE

In the next issue of the Journal we will announce a definite evening every week when the Editorial staff can meet any and all who are interested in the work and policy of our magazine. We hope these round-table meetings will divide the Editorial work and perfect the work of the Journal.

SENECIO CRASSISSIMUS

By ERIC WALTHER

No one could possibly remember our late Cactus-show more vividly than the writer who was privileged to act as one of the judges. To the usual regret that one could not give a prize to all the deserving exhibitors was added an-

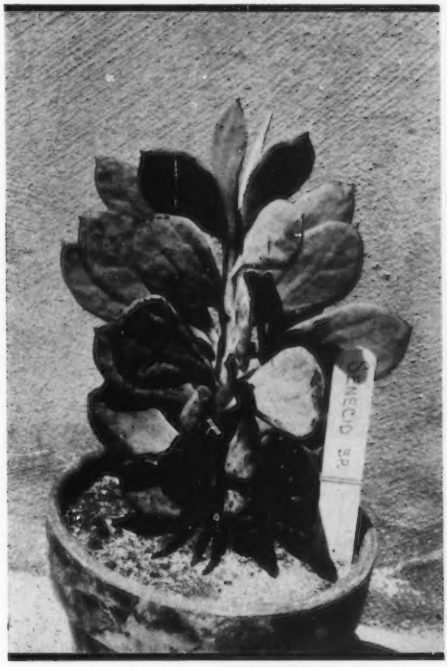


Photo by J. West
Plant in collection of E. O. Orpet, app. x0.25.

other, i. e., that what was to us personally the most interesting exhibit was not in competition, being staged by Mr. Orpet, our fellow-judge. There is no doubt but that he readily could have won several prizes, and certainly the one for the rarest succulent shown. This is the subject of our photo No. 1, and, as far as we know, is the only example of this extant locally. The plant was originally distributed by the Office of Foreign Plant Introduction of the Bureau of Plant Industry as a Senecio from Madagascar.* Its succulency suggests that it might really belong to *Kleinia,* a genus very uncertainly separable from *Senecio* unless undue weight is placed on succulency. However this may be, further information seemed unobtainable, which aroused our curiosity. A consultation of the *Index Kewensis,* the standard reference work to all plant names ever published anywhere, established by the famous Charles Darwin, showed that a number of *Compositae* had been described recently from Madagascar by the French botanist, Dr. Humber, including one with the very suggestive name *Senecio crassissimus,* the specific name meaning "thickest." Through the courtesy of the librarians of both the California Academy of Sciences and the University of California we were able to consult the original Latin and French description in the "Memoires de la Societe Linneenne de Normandie," a part of which we here translate as follows:

Senecio crassissimus Humber: Fleshy shrub, glabrous, much branched, 5 to 9 dm. tall to base of flowering shoots, stem roughened by the scars of the fallen leaves. Leaves spreading spirally, sessile, entire or sometimes with 1 or 2 lateral teeth, broadly obovate, 4 to 6 cm. long by 2 to 3 cm. broad, shortly acuminate-mucronulate, in lower half cuneately narrowed towards base, flat, very thick and fleshy, 3 to 5 mm. thick, obscurely many-nerved.

That part of the text pertaining to the flowers we omit, as they are still to be produced here. It will be seen that the quoted description fits fairly well, well enough in fact to cause our adoption of this name until we are proven wrong. Of course all this is scarcely scientific botany, but when dealing with exotics a certain amount of guesswork is inevitable in view of the scattered literature dealing with the subject-matter.

*S.P.I. 77934.

We Modestly Accept in Dr. Britton's Name

Cactus and Succulent Society of America,
Los Angeles, California.

Many, many thanks for the lovely review given Texas Cacti *in the August number of your magazine.*

You have sent Texas a sample of the type of co-operation that has made California what it is in every field. This review is sincerely appreciated by both Mr. Runyon and myself.

Very cordially yours,
ELLEN D. SCHULTZ
and ROBERT RUNYON,
Authors of "Texas Cacti."

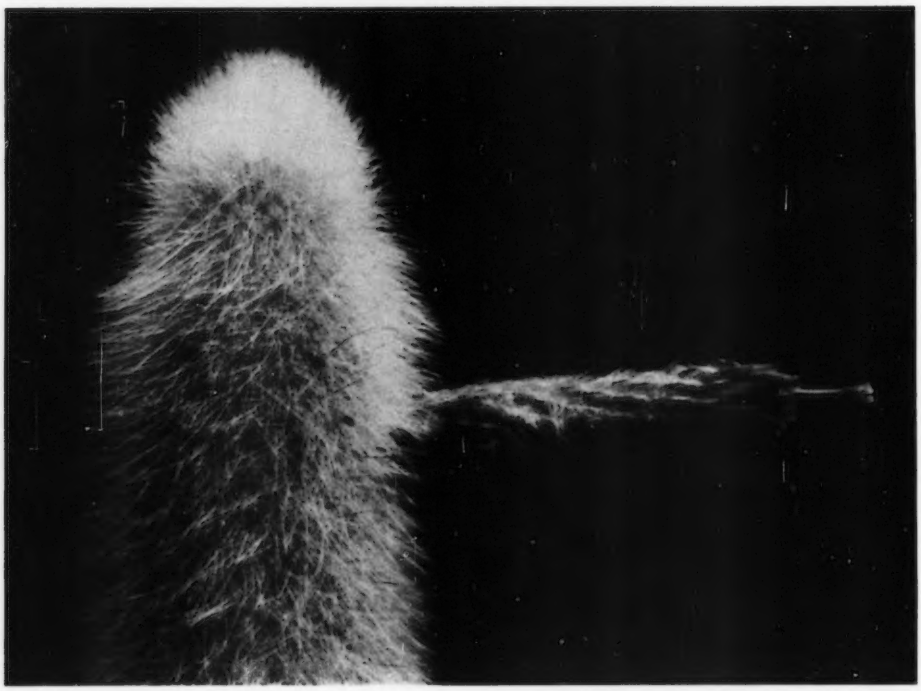


Photo by Count Knuth

The tubular flower of *Borzicactus strausii* is very peculiar. Although this species has been known in collections for about thirty years, Britton and Rose referred it to *Oreocereus celsianus,* a very distinct species. *Borz. strausii* is found in the high mountains of Bolivia where it is quite abundant in certain localities. Mature plants are 4 to 8 ft. high, sometimes branched from near the base. The crimson flowers are 3 in. long; their shape is typical for the genus *Borzicactus*. The spines are white, but varieties with darker central spines are also known.

EDITOR'S NOTE: This is one of a series of photographs by Count F. M. Knuth Knuthenborg, Bandholm, Denmark. Count Knuth is publishing a book on Cacti and a review will soon be published. Even though the book is written in Danish it will be very valuable to American readers for its 180 wonderful illustrations.

Some of Our Native Tropical Cacti

ROBERT WILLICH (Age 14) Leonia, New Jersey

During the time that I have subscribed to the Journal I have never seen an article written on cacti that are native to our own southern states. I want to put special emphasis on the Cereus because there are more kinds found here than on our western deserts.

Starting a little south of Miami on the Florida mainland we have Harrisia Simpsonii, these are long, slender, columnar plants with white buds and orange fruit. The species (at the most) grows to a height of twenty feet. Also in this district one may come across Acanthocereus pentagonus, these can readily be distinguished by the triangular stems. I have noticed that the small plants usually have five ribs, then diminishing to the large three. Suspended from an old dead tree we might find Rhipsalis Cassutha, these are quite hard to find as they blend in with the rest of the foliage. The stems of this species are string-like, containing numerous berries that are either white or a light pink.

Going among the Keys, we might find the tall, columnar Cephalocereus Deeringii, which was named after Charles Deering. The branches of Cephalocereus Deeringii do not spread out but stay close to the main stem. A group of Cephalocereus keyensis would be a lucky find as they were nearly exterminated, by clearing the hummock on which it grew for war purposes. The plant does not grow higher than fifteen feet, the average height being about twelve. The stems grow close together like a barricade, there is little branching.

Traveling north on the Florida West Coast in the region of the Ten Thousand Islands and Tampa Bay, we might find Harrisia aboriginium growing on the shell mounds formed by the Aborigines from which the plant gets its name. The flowers are slightly odorous, forming yellow, globular fruit.

On the Texas coast, especially near the Rio Grande,

(Continued on page 336)

EUPHORBIA HEPTAGONA

By G. A. FRICK

Euphorbia heptagona, Linn, has been in cultivation previous to 1717, at which period it was introduced by the Dutch into Leyden Botanic Garden and figured by Boerhaave. Subsequently the same plant was figured by Bradley, for he states that there was only one specimen at the Leyden Garden, but the drawings of both men differ, for two branches shown in Boerhaave's figure are missing in Bradley's, which between the period of the two drawings, were probably removed for propagation.

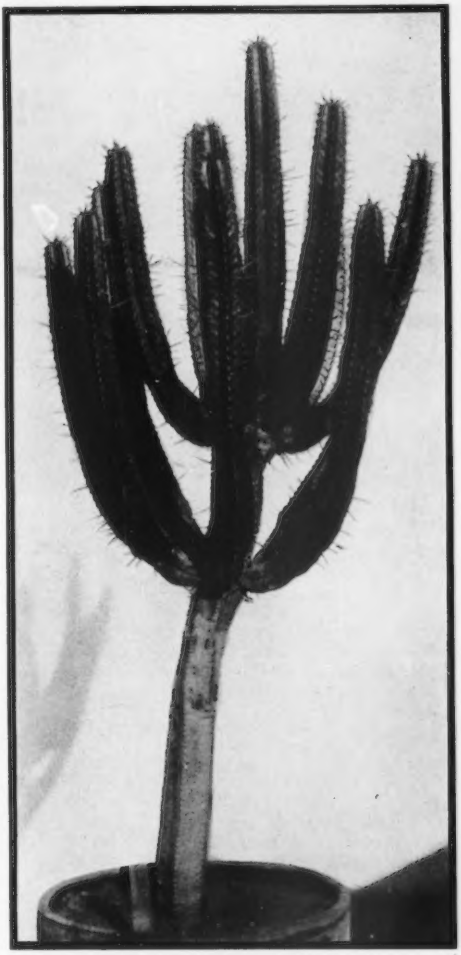
Habitat near Prince Albert, South Africa, where they attain a far greater size than the plant grown at Leyden, and are more spiny than the cultivated plant, but seem otherwise to be the same species; grown out doors in Southern California this species gets as high as 6 to 10 feet, and from photographs seen, they evidently do not get much higher in their native environment.

E. heptagona seems to have more than its just share of trade names and synonyms. The writer has purchased them from mail order dealers having the plant listed as *E. enopla, E. morinii, E. candalabra, E. hexagona, E. captiosa* and *E. ferox,* and it is to overcome this confusion and avoid disappointments to others purchasing plants in this manner, that this article is intended.

Small rooted cuttings of *E. captiosa* and *E. ferox* could be mistaken by the uninitiated, for *E. heptagona* easy enough, but when grown to plant size the difference is so great, that anyone having seen both plants could not mistake the former for the latter.

E. candalabra and *E. hexagona* no doubt are trade names given these two species by dealers for the want of the correct one, and there really is merit to their nomenclature. *E. heptagona* does grow in a candalabrum form, and does not require a far fetched imagination to add this name to the plant if the correct one is missing. The same reason is true of *E. hexagona,* as this description agrees with the number of ribs on the branches, rarely having 5 or 7.

The likeness of *E. enopla* is very nearly exact, the difference being that the spines in this species are very numerous, never grows taller than 12 to 15 inches high, bushily branching at the base, and above; branches 5 to 9 inches long, 7/8 to 1¼ inch in diameter, 6 and sometimes 7 angled. The closest observer can mistake *E. enopla* for *E. heptagona* as noted in the description of *E. enopla* in Berger's "Sukkulente Euphorbien," which does not agree with this plant and should apply to *E. heptagona.* A very pretty specimen of *E. enopla* is growing in the Orpet collection at Santa Barbara, but is not listed in



E. heptagona, Linn

Photo by Wright Pierce of 4 foot plant in author's collection.

the succulents of that district, it is doubtful if there are any others to be found growing in the United States.

It is said that every family has its black sheep, and this is also true of the group of Cactoid Euphorbia, this trouble maker is *E. morinii,* and to the collector that is particular about his nomenclature, this plant is a nightmare. If all the *E. morinii* labels on plants were destroyed it would greatly improve the patience and nerves of most of us. N. E. Brown in the "Flora Capensis" has this to say: "I have not seen the type of *E. morinii,* Berger, but a plant sent to Kew Gardens, London, as being that species is certainly not distinct from *E. heptagona,* nor do I find any character in Mr. Berger's description to separate it from the later species." Dr. von Poellnitz of Germany says: *"E. morinii* Berger, should be *E. heptagona* Linn."

That should eliminate *E. morinii* in the minds and collections of our Euphorbia friends, unless Mr. Berger comes forward with more definite information of his plant.

N. E. Brown mentions a *E. heptagona* var. *dentata,* the difference being that the angles of the stem or branches are distinctly toothed between the spines and the centre of each of the grooves between the angles marked with a zigzag imprssed line.

E. heptagona is an attractive interesting plant at all times; is hardy, can endure neglect and abuse without apparent injury; strikes roots readily from cutting; and if given rich enough soil prosperity sometimes produces crestates. This sounds like a broad statement, but two plants have responded to this kindness in my collection, and I can not attribute it to any other reason than plenty of fertilization. Unlike most of the other Euphorbia, this plant growing in a warm protected position, and watered regularly, will show new growth every month throughout the year, but it is advisable to withhold water during the winter months, thus forcing the plant into dormancy and assuring a more robust and rapid growth when watering again starts. When grown in an excessively damp and poorly ventilated hot house, this plant will develop a permanent coating of rust, which mars the appearance of the plant, but does no noticeable harm other than to lower its commercial value.

Taking a Sunday morning stroll along the waterfront at Vancouver, B. C., this summer, my attention was directed to a weedless, orderly vegetable garden surrounding a hermit's shack. The sociable old French Canadian occupant boasted that he grew the largest and finest vegetables in Canada. Perhaps he did, who knows? Growing in a gallon can on his window sill, he had a small badly cut up plant of *E. heptagona,* and in answer to my inquiry he told me that it was given to him by the cook of an English vessel that docked nearby, with the information that it would remove warts. And there were several longshoremen in the neighborhood who had been relieved of their warts by applying the milky juice of that very plant! Surmising that perhaps I thought him a humbug, he took out his knife and cut a gash into the plant proving it did have milk within, and after assuring me that his was the only plant of its kind in North America, and that he would not take $500 for it, I left him with the same satisfied notion about his *E. heptagona* that I found him.

Description: Erect, succulent, branching, spiny and leafless, 2 to 8 feet high, unisexual; stems and branches ¾ to 1¾ inch thick, 5 to 8 angled, glabrous, slightly glaucous; leaves rudimentary ¼ to ½ inch long, deltoid, sessile, their base neither seated upon nor forming a small tubercle, but even with the general level of the crests of the angles; spines are modified peduncles, solitary, regularly scattered along the angles, very spreading, straight, ¼to 1 inch long, purple brown, becoming gray with age; flower, yellow; seeds, subglobose, smooth, brown; capsule gray.

AERIAL ROOTLETS

These appear on plants of most Cacti and Succulents, and are unsightly for show purposes or display. They doubtless have some work to perform in the economy of the plant, but are nevertheless not essential in its growth. Those who wish may remove them without working an injury to the plant.

We take pleasure in announcing that there will be no available space for poetry in our Journal. We would be glad to publish the wealth of such material and, like Ned Lawrence's Evening Herald, we must have certain limitations as to contents. Surely there must be more of our members who want to tell us about their plants and experiences.

(Continued from page 334)

we may find Selenocereus spinulosus, with its four, or occasionally five or more angles. Acanthocereus pentagonus is also found in this district.

Let us hope that collectors will never ship these beautiful plants out of our native tropics as extensively as they have shipped them out of some of our southwestern states.

My knowledge of cacti is limited as I have been only studying them for four years, starting with my tenth year.

KNOW YOUR CACTUS

A short account of the principle characteristics by which cacti are grouped and classified may not be without interest to the readers of the Journal.

From the singular form and succulent nature of the whole cacti family, it might be inferred that, in the characteristics alone we have reliable marks of relationship, and that it would be safe to call all these plants Cacti in which such characteristics are manifest.

A glance at some members of the families, will however, soon show how easily one might thus be mistaken.

In the *Euphorbias* we find a number of kinds, especially amongst those that inhabit the dry, sandy plains of South Africa, which bear a striking resemblance to many of the cacti, particularly the columnar and the *Rhipsalis*.

Amongst *Stapelias* too, we meet with plants which mimic the stem characters of some of the smaller kinds of cacti.

Again, in the cacti themselves we have curious cases of plant mimicry; as, for instance the *Rhipsalis,* which looks like a bunch of mistletoe; and the *Pereskia,* the leaves and habit of which are more like what belongs to the gooseberry family than to a form of cactus. From this it will be seen that although these plants are almost all succulent and curiously formed they are by no means singular in this respect. The characteristics of the order are thus defined by botanists: Cacti are either herbs, shrubs, or trees, with soft flesh and copious watery juice. Roots woody, branching, with soft bark. Stem branching or simple, round, angular, channelled, winged, flattened, or cylindrical; sometimes clothed with numerous tufts of spines which vary considerably; or, when spineless, the stems bear numerous dot-like scars, termed areoles. Leaves very minute, or entirely absent, falling off very early except in *Pereskia* and several of the *Opuntias,* in which they are large, fleshy and persistent.

Flowers solitary, except in *Pereskia,* and borne on top or side of the stem; they are composed of numerous parts or segments; the sepals and petals are not easily distinguished from each other; the calyx tube is jointed to, or combined, with the ovary, and is often covered with scale-like sepals and hairs or spines; the calyx is sometimes partly united so as to form a tube, and the petals are spread in regular whorls, except in the *Epiphyllums.*

Stamens many, springing from the side of the tube or throat of the calyx, sometimes jointed to the petals, generally equal in length; anthers small and oblong.

Ovary smooth or covered with scales and spines, or woolly, one celled; style simple, filiforms or cylindrical, with a stigma of two or more spreading rays, upon which are small papillae.

Fruit pulpy, smooth, scaly or spiny, the pulp soft and juicy, sweet or acid, and full of numerous small, usually black seeds.

Pachycereus pringlei

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NOTICE OF OCTOBER MEETING

Arrangements are being made to hold the October meeting of the Society in the Blakesly Botanic Gardens, Santa Barbara, on Sunday afternoon, October 19 at 1 o'clock.

Complete details cannot be given at this time. Those who desire to take lunch will find a delightful eating place under the live oaks. If convenient take your camp stools along.

After greeting our Santa Barbara friends and a brief business meeting it is planned to visit some cactus and succulent gardens in the city.

The Blakesly Gardens are in the vicinity of the Santa Barbara Mission. Inquire upon reaching the city as to the exact location if you have not been there before.

If October 19th be stormy, the meeting will be postponed till the following Sunday, October 26th.

REMEMBER THE DATE—October 19th.

BOYD L. SLOANE, *Secretary.*

The August Meeting and the San Diego Region

By JACOLYN MANNING, M.D.

We arrived in San Diego at noon, and after an excellent lunch drove out Imperial Avenue to the McCabe Cactus Gardens where we found seventy members and friends of the CACTUS SOCIETY already assembled. The group which had driven down from Los Angeles included: President Willis and party of four, Editor Scott Haselton, Col. and Mrs. Lawrence, Secretary, and Mrs. Boyd Sloane, Col. Perrie Kewen, Mr. and Mrs. Frick and sons, Dr. and Mrs. A. D. Houghton, Mrs. Holman and Dr. Jacolyn Manning with a party from La Jolla, and many others.

The meeting called to order by President Willis, proved to be both important and interesting. A motion was made and carried that the United States Department of Agriculture, Plant Quarantine and Control Administration of Washington, D. C., be requested to establish a quarantine station in Southern California. By the present law imported succulents must be examined in Washington, D. C., or in San Francisco, if shipped by water on the Pacific Ocean.

A member of the Society, who attended the five hour session investigation, related the testimony which exonerated a Los Angeles exporter of North American succulents from complicity in evading Federal law.

San Diego's distinguished woman horticulturist, Miss Kate Sessions, gave an informal and instructive talk. Her present problem, she said, was the proper setting for cacti in re sun and shade. She had discovered that these so called children of the sun, many of them, thrived and became more beautiful in partial shade. Even an "old burnt-out aloe improved wonderfully when removed to one-half shade." She advocated the planting of deciduous trees in a cactus garden, and recommended the European sycamore bare of foliage from December first to March first. Miss Sessions also commented on the increase in beauty and value of specimen succulents when allowed to develop to full maturity with no removal of offshoots nor cuttings.

The meeting adjourned in time for members to examine rare specimens in the McCabe Gardens, and also visit the Knickerbocker and Stromquist Cactus Gardens. We found Mrs. Neff Bakkers a well-informed young woman who had chosen the management of a cactus business as one way of satisfying the desire for an out-of-door life, and who admitted the most zealous study of the monthly numbers of the CACTUS JOURNAL.

Our most instructive visit was made to Escondido and the several propagating houses of Mr. W. I. Beecroft. Mr. Beecroft will long be remembered as the introducer of the sensational and beautiful new *Neomammillaria hahniana* to the cactus lovers of the United States. The hour spent in his reserve house where importations are kept for propagation only and cannot be marketed was all too short. It contained many choice and rare plants, but our interest in columnar cereus and more especially the haar-kakteen centered in a single fine specimen of *Pilocereus hoppenstedtii,* and a group of the exquisitely beautiful *Cephalocereus palmeri.* There was also a fine stand of *C. senilis,* but the finished beauty of *palmeri* with every silvery hair in place, suggested a distingué military officer mingling with hoary peasantry. Mr. Beecroft is preparing to remove to a higher and frostless area, and offers some excellent bargains in field specimens of *Cerei.* If sold at bargain price, they could not be delivered, but Mr. Beecroft would assist purchaser in loading these plants on a truck or trailer.

RARE CACTI AND EXOTIC CACTUS SEED

Mr. Wilhelm Hennis, Jr., of Heldesheim, Germany, who is making an extensive collecting trip through Venezuela and Colombia for Cacti and Orchids, has given me the agency for the United States and Canada for his plants from the above mentioned countries and Cactus seed from Peru and Bolivia also. Here is an opportunity for importers to get some of the rarities from South America. The prices are reasonable, $1.00-$1.25 each, and postage, and will include such rarities as follows:

Neomamillaria mammillaris
Melocactus amoenus
Cephalocereus albispinus
Cephalocereus lanuginosus
Cephalocereus colombianus
Cephalocereus species

Cuttings of the Cephalocereus will be 20-30 cm. long.

OPUNTIA SEED SPECIAL

I have a fine supply of rare Opuntia seeds on hand as listed by Mr. Ferdinand Schmoll. These seeds are all rare types and at least five are hairy under glass.

20 sp. opuntia, 1 gram of each, reg. $2.75-$2.25, including the following which may be had separately:

Opuntia cantabrigiensis 25c
Opuntia megarhiza 20c
Opuntia crinifera 20c
Opuntia pilifera blanco 20c
Opuntia pilifera 20c
—All hairy under glass.

Very few growers have taken advantage of the low price on the four species of *Echinocactus ingens* as offered at 25c per gram. These seeds are very fertile and grow quite rapidly and make rare plants in the United States. The seed is of medium size and there are about 600 or more to a gram.

During March I hope to have the rare *Melocactus intortus* with a cephalium at least 2 inches tall at $15.00 postpaid to California and Texas. Weight 15-20 lbs. Also more cuttings of the *Cephalocereus royenii* at $5.00 per foot. Every cut with flowering areoles and also other rare species from the West Indies.

My seed catalogue, listing several hundred rare species of Cactus seed free upon request.

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